# INDIANA STATE DEPARTMENT OF HEALTH
## Initial Report on Fireworks-Related Injuries
## (Period of May 13, 2003 – July 19, 2003)

Legislation passed this year by the Indiana General Assembly (HEA 1131) requires physicians, hospitals, and outpatient surgery centers to report all injuries resulting from fireworks or pyrotechnics to the Indiana State Department of Health. This report presents data compiled from reports received for the 10-week period noted above.

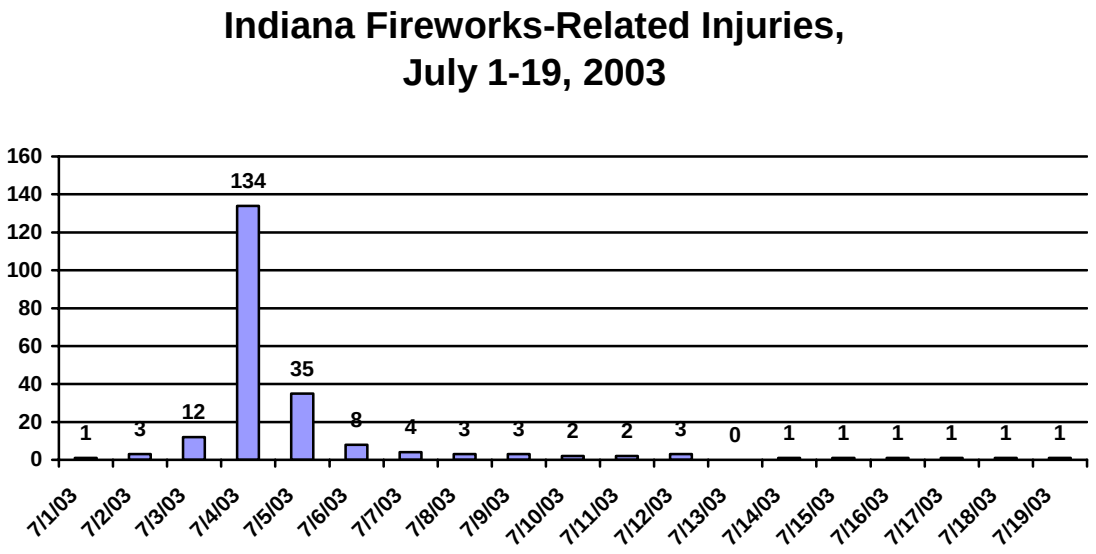
### HIGHLIGHTS

- **As of July 19th, there were 261 unduplicated cases reported to ISDH.**
- **Fifty-three percent of all fireworks-related injuries reported involve children and adolescents, who represent a fourth of the population in Indiana.**
- **Three fourths of cases reported sustained burn injuries, with burns of the hands being the most common type of injury.**
- **About one out of five of all injuries reported involved the eyes, with 82 percent of those with eye injuries not using any method of eye protection.**
- **Eleven percent of injured persons required either hospital admission or specialized care for burns or eye injuries.**
- **Sparklers, rockets and firecrackers were associated with 63 percent of all injuries reported.**
- **Fireworks use on private property accounts for more than 80 percent of the injuries reported.**

### Fireworks-Related Injuries

- Seventy-three percent (190) of the reported injuries involved males and 27 percent (71) involved females.
- Eighty-four percent (219) of the injuries were among the white race; Black/African Americans accounted for 10 percent (25) of all injuries.
- The median age of those injured was 18 years (average=20 years; range=6 weeks to 74 years).
- The first case was reported on May 13, 2003 with a total of three cases reported for the month of May.
- Thirty-one cases were reported in June and 216 cases were reported in July.
- Fifty-two percent (134) of the injuries occurred on July 4th and 76 percent (189) of all injuries occurred between July 3rd-6th.

Figure 1: Fireworks-Related Injuries by Date, July 1-19, 2003.




The types of fireworks most frequently resulting in injury (63 percent in total) were sparklers, rockets, and firecrackers (Table 1). Many other types of fireworks were reported, including ¼ stick of dynamite, smoke bombs, and spewed strobe lights. Although 27 percent (70) of the reports noted that the injury resulted from mishandling fireworks, 36 percent (95) reported that the injury resulted from fireworks malfunction or an errant path of a rocket.

Seventy-six percent (198) of the cases experienced injury from burns. Of these, seventy percent (139) received 2$^{nd}$ degree burns and 7 percent (13) had 3$^{rd}$ degree burns. Other types of injuries included contusions/lacerations/abrasions (48 cases), penetrating foreign body/missiles (16 cases), puncture wounds (6 cases) and sprains/fractures (2 cases). One-half of injuries involved the hands or eyes, although injuries to many parts of the body were reported (Table 2).

Among the 92 percent (240) who reported the location of the activity that resulted in injuries, 59 percent (142) occurred at the injured person's private home, yard, or property. A friend/neighbor/relatives home or property was involved for 24 percent (57); public property was noted for 10 percent (24).

Although most reports (226) did not provide information on alcohol consumption, 13 percent (35) stated that alcohol was imbibed related to the injury and 26 of these noted alcohol use within three hours of the injury. Three adolescents reported using alcohol. An additional 10 percent (25) of the injury reports stated that other people at the scene used alcohol.

Fourteen percent (37) of all people injured were bystanders. Among those injured who were less than 18 years of age or less, 60 percent (83) of the injuries happened while in the presence of an adult.

Table 1: Frequency of Type of Fireworks Involved in Injury, All Injuries.

| **Type of Fireworks / Pyrotechnics** | **Frequency** | **Percent** |
|---|---|---|
| Sparkler | 61 | 23.4% |
| Rockets (i.e., bottle rockets) | 56 | 21.5% |
| Firecrackers | 48 | 18.4% |
| Aerial Devices | 21 | 8.0% |
| Pyrotechnics* | 15 | 5.7% |
| Twister / "Jumping Jacks" | 8 | 3.1% |
| Lightning Gunpowder | 3 | 1.1% |
| Homemade, altered devices | 2 | 0.8% |
| Unspecified / Unknown / Other | 47 | 18.0% |
| **Total** | **261** | **100%** |

*Upon review of the reported injuries, the Office of the State Fire Marshal determined that only 1 of the 15 reported pyrotechnic related injuries actually resulted from a true indoor pyrotechnic display. The 14 other reported pyrotechnic related injuries resulted from outdoor fireworks displays.

Table 2. Frequency of Body Part Injured, All Injuries.

| **Body Part Involved**** | **Frequency**** | **Percent of Injured Persons**** | **Percent of All Injuries**** |
|---|---|---|---|
| Hand | 114 | 43.7% | 34.2% |
| Eye | 57 | 21.8% | 17.1% |
| Leg | 46 | 17.6% | 13.8% |
| Face/Ears/Head | 40 | 15.3% | 12.0% |
| Arm | 39 | 14.9% | 11.7% |
| Trunk | 30 | 11.5% | 9.0% |
| Other | 7 | 2.7% | 2.1% |
| **Total** | **333** | **127.6%** | **100%** |

**Not mutually exclusive, some cases received injuries to multiple body parts.

The next portion of this report describes the characteristics of the reported injuries for three specific age groups – children, adolescents, and adults. Please see the Appendix for three graphs demonstrating the age-related distribution of the types of injuries, body parts involved, and the types of fireworks involved.

## CHILDREN: SIX WEEKS THROUGH ELEVEN YEARS OF AGE

There were 78 (55 male and 23 female) injuries reported in children. The types of fireworks mainly resulting in injury included sparklers (32 cases), rockets (13 cases) and firecrackers (11 cases). Burns were sustained by 85 percent (66) of the cases in this age group.

The most frequently reported injured body part was the hand (29 cases). Injuries to other body parts included the leg (16 cases), eye (15 cases), arm (13 cases), and face/ears/head (11 cases). None of those with eye injuries were using eye protection. The majority of these injuries (72 percent or 56) happened in the presence of an adult. Seven reports noted alcohol use at the scene at the time of the injury. Twelve of the injured children were bystanders. The only child admitted to a hospital was a one-year old bystander who sustained 1st and 2nd degree burns. The majority (87 percent or 68) of those injured were evaluated in hospital emergency departments and then released. Seventy-one percent (55) of the injuries occurred from July 3rd-6th while 50 percent (39) occurred on July 4th.

## ADOLESCENTS: TWELVE THROUGH EIGHTEEN YEARS OF AGE

Among adolescents, there were 60 fireworks-related injuries, involving 46 males and 14 females. The most frequent type of fireworks involved among this age group was rockets (20 injuries), followed by firecrackers (16 injuries) and sparklers (8 injuries). Seventy-three percent of the cases experienced burn injuries. Other types of injuries reported included smoke irritation and hearing deficit.

The hand was the most frequently reported body part injured (24 cases). Injuries to other parts of the body included the eye (20 cases), arm (11 cases), face/ears/head (10 cases), leg (8 cases) and trunk (6 cases). Among those with eye injuries, fifteen were not wearing eye protection; two were wearing contact lenses (three unknowns). One person sustained probable loss of vision in the left eye. Two cases were admitted to hospitals. Four cases were transferred to or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers).

Sixty-three percent (38) of the injuries occurred from July 3rd-6th and 42 percent (25) occurred on July 4th. The use of alcohol was reported for three cases. Twenty-seven injuries (45 percent) occurred while in the presence of an adult. Eight of the injured were bystanders. Although the most frequently reported mechanism of injury involved mishandling of fireworks, 22 people reported injury resulting from malfunctioning or errant paths of the fireworks. Pyrotechnics were involved in four cases.

## ADULTS: NINETEEN YEARS OF AGE AND OLDER

There were 123 injuries (47 percent of all cases) reported among those age nineteen years and older (89 males and 34 females). The types of fireworks primarily involved in the injuries were rockets (23 cases), firecrackers (21 cases), and sparklers (21 cases). Pyrotechnics were involved in 11 cases. Seventy-two percent (88) of the adults experienced burn injuries.

Hand injuries were reported 61 times. Injuries also included the eye (22 cases), face/ears/head or leg (19 cases each), trunk (18 cases) and arm (15 cases). For those with eye injuries, sixteen were not wearing eye protection and two had eyeglasses or safety glasses (four unknowns). Six cases were admitted to hospitals. Eleven cases were transferred to or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers).

Seventy-eight percent (96) of the injuries occurred from July 3rd-6th and 57 percent (70) of the injuries occurred on July 4th. The use of alcohol was reported by 26 percent (32) of injured adults and 20 percent (24) imbibed alcohol within three hours of the injury. Seventeen of the injured cases were bystanders. Fifty-five cases reported an injury resulting from malfunctioning fireworks or an errant path of rockets. Twenty-nine of the reports noted that mishandling of fireworks resulted in injury.

## SUMMARY

For the 261 cases of fireworks-related injury that comprise this report, three-fourths of all injuries reported occurred from July 3$^{rd}$- 6$^{th}$, including 52 (134) percent of injuries that took place on Independence Day. While those injured ranged in age from 6 weeks to 74 years, children and adolescents comprised over one-half (53 percent) of the reported cases. According to the 2000 U.S. Census population estimates for Indiana, persons under 18 years of age represent a fourth of the population. Adults were present 60 percent of the time for injuries reported in children and adolescents. Males were involved in almost three-fourths of all cases reported, which is a common finding for many traumatic injuries. The racial distribution of those injured was similar to that of the population of Indiana.

As expected, burns were the most frequent type of injury, involving 76 percent (198) of all reported cases. While the hands were the part of the body most commonly injured (34 percent), injuries to the eye (17 percent) were also quite frequent, with the great majority (82 percent) of those with eye injuries reporting no method of eye protection in use. Bystanders were injured in 14 percent (37) of reported cases. Hospital admission was needed for 3.4 percent of those injured, with an additional 7.7 percent requiring specialized care for either burn injuries or eye injuries. There were no deaths reported related to fireworks injuries during the time period of this report.

When the location of the activity using fireworks was identified, 83 percent (199) of cases reported occurred at private home, yard, or property (self-owned or friend, neighbor or relative). The type of fireworks involved in injuries varied somewhat by age, with sparklers causing the most injuries in young children, rockets, sparklers and firecrackers involved in adolescents, and a fairly equal distribution of these three types of fireworks also affecting injured adults.

Mishandling or malfunction of fireworks was the most frequent mechanism reported for fireworks-associated injury, accounting for about one-half of all those injured. Although

whether alcohol was used was not stated for 87 percent of the reported cases, alcohol use occurred at the scene of activities affecting injured persons of all age groups. One-quarter of the adults injured involved the use of alcohol.

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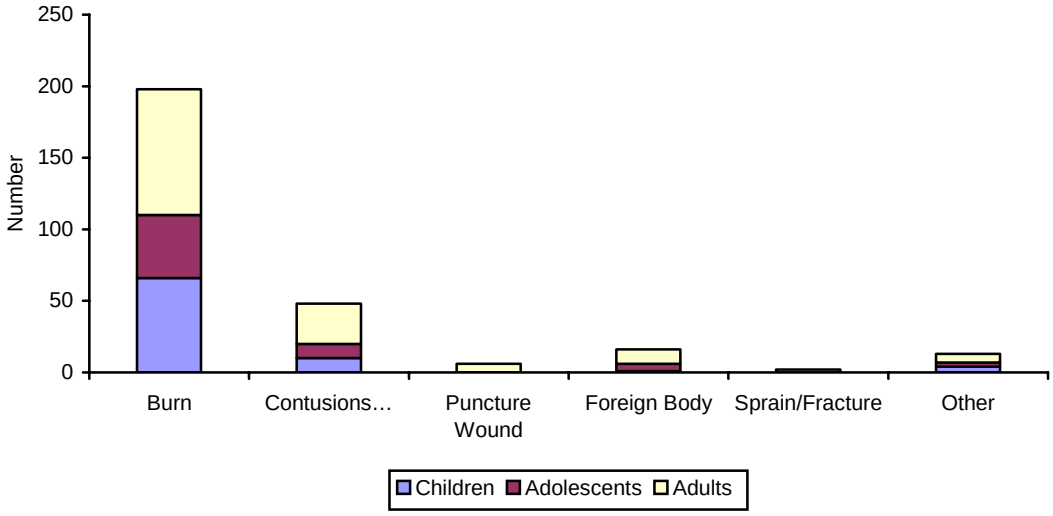
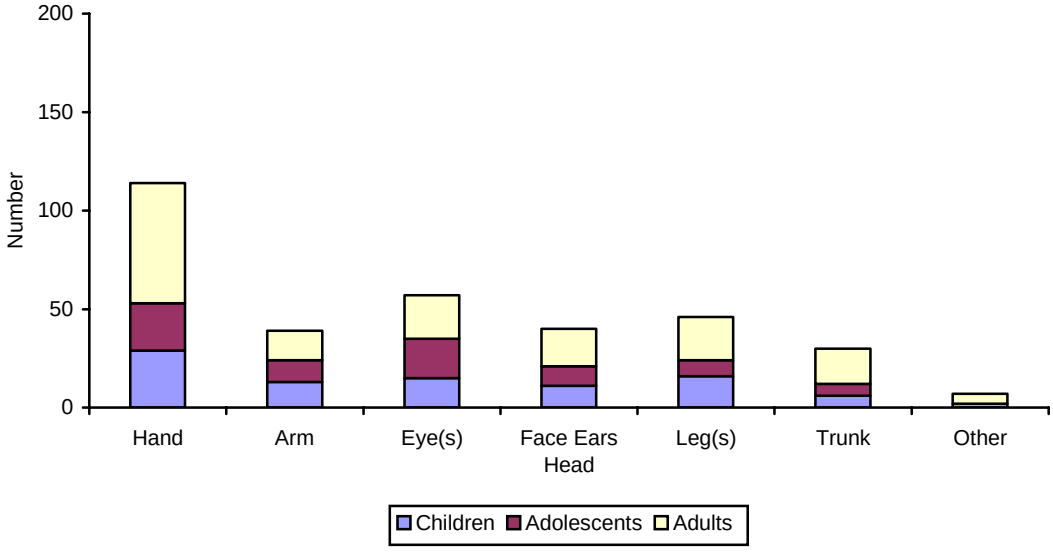
# APPENDIX

**Type of Injury Involved in Fireworks, Indiana**
**May 13 - June 19, 2003**




**Body Parts Involved in Injury, Indiana**
**May 13 - June 19, 2003**



**Types of Fireworks Involved in Injury, Indiana**
**May 13 - July 19, 2003**